Sustainability of clothing rental in Japan

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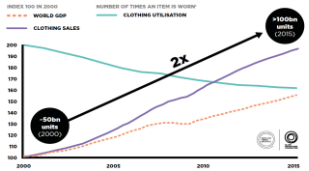
Background

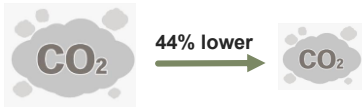


Growth of clothing sales and decline in clothing utilization since 2000

Clothing production doubled

Clothing utilization decreased by 36%

If the number of times a garment is worn was doubled on average (1)



Clothing Rental Subscriptions

- Clothing Rental Subscriptions can be a useful business model for circular economy through the increase of the utilization rate of clothing
- Clothing Rental Subscriptions can be a useful business model for circular economy from the perspective of extending product life, sharing, and the provision of product-service (2).

Objective

To analyze Clothing Rental Subscriptions in Japan from the perspective of product life extension, sharing and product-service systems.

Clothing Rental Subscriptions in Japan

	Founded by	year	Member	Procurement	Resell after renting	
A	Clothing rental business	2015	・Paying members :Unknown ・Free membership > 250,000 (Apr. 2019)	New	O	・Company A released their statistics on the final purchases per individual. The highest purchase made by a customer was 102 items of clothing in 4 years. ・Handles over 300 brands. ・Rental products are selected by a stylist. This service has a high reputation, and many customers have the tendency to purchase an item after they rent it.In many cases, revenue has been gained through sales. ・Procures highly durable clothing to increase the number of times an item can be rented. ・Is preparing to open rental services to external brands to provide a rent service as a way to try on new clothing. Each brand will store items and rent as a consignment.
B	Apparel manufacturer	2015	・Paying members > 20,000 ・App downloads > 1,000,000 (Nov. 2019)	New	O	・The only surplus company(excluding advertising cost) among the clothing rental subscription companies as of January 2019 in Japan ・As it was set up by an apparel manufacturer, the purchasing costs of Company B are lower than those of others. Moreover, there is no inventory risk as a result of the centralized inventory with an in-house EC(Electronic Commerce). ・Handles both house brands and GREEN PARKS (select brands). Does not consider expanding the number of the brands. ・Secures profit by reselling returned product that has been rented once. ・Does not rent garments that have already been rented once as this requires a management cost ・Through the subscription model, it can expand the customer base of its own brand. (70% are the new customers)
C	Used clothes dealer →Apparel manufacturer	2016	・Paying members :Unknown ・App downloads > 60,000 (July 2017)	Used →New	O	・Changed from used to new rental items in January 2019 ・Only handles apparel manufacturer products that have a capital relationship.
D	IT→IT	2016	・Paying members > 3,000 ・Free membership > 17,000 (Dec.2018)	New	O	・Has its own original brand. ・Procures highly durable clothing. ・Both operating losses and ordinary losses reached 74 million yen in 2017; the company was bought for 37 million yen by IT company.

Clothing Rental Subscriptions in Japan from the perspective of circular economy

- Clothing Rental Subscriptions in Japan started 4 years ago and the market is still relatively small. The largest subscription has 220,000 paying members.
- Many of companies are experiencing a difficult time in terms of gaining revenue. There is only one company that is in surplus and that resell the clothes that it has rented once. Moreover, one company is preparing to open up rental services to external brands to increase the number of try-on services.
- Clothing Rental Subscriptions in Japan can contribute to some extent to the extension of the life of the product, sharing and the provision of product-service.

Conclusion and Future Direction

- Clothing Rental Subscriptions have the potential to foster change in apparel consumption patterns from possession to use; however, with current practices, it will take some time to achieve this change.
- Further development of the design of the Clothing Rental Subscriptions business model is necessary to contribute to a circular economy for clothing.

(1) A New Textiles Economy (Ellen MacArthur Foundation, 2017)
(2) Business Models for the Circular Economy (OECD 2018)
(3) Arranged based on quoted articles

On Sustainability

Comfort and Sustainability in Low-cost Housing:

Opportunities and Contradictions in Existing Frameworks in Mexican and Chilean Desert Climates

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A multi-perspective evaluation framework based on energy simulation was used to find alternative strategies and construction systems for low-cost housing in Mexico and Chile, providing significant comfort, economic, and environmental benefits for minimal investment.

Abstract

In Mexico and Chile, passive strategies (e.g., thermal mass), are missing from the rhetoric of developers, policy-makers, and designers, leading to a noticeable gap in the application of sustainable practices between high-end and low-cost housing. The absence of design for comfort in this context leads to people living in uncomfortable conditions and/or relying on the use of costly, energy-intensive solutions such as air conditioning, especially in desert climates. Furthermore, multiple, frequently opposing objectives such as maximizing comfort and minimizing cost complicate the matter. This research aimed to find opportunities and contradictions for sustainability in low-cost housing within the current financial, political, and construction frameworks in Mexican and Chilean desert climates, using a multi-perspective sustainability evaluation framework based on energy simulation.

Background

Mexico and Chile have grown significantly over the last years and have developed extensive housing policies and programs to cover housing demand. While the problem of quantity is slowly being covered, the problem of quality remains, leading to a noticeable gap in knowledge and application of sustainable practices between high-end and low-cost housing.

The mandatory energy code in both countries (NOM-020-ENER-2011 and OGUC) focuses mainly on insulation. Similarly, programs tackling sustainability in low-cost housing in both countries (e.g., Hipoteca Verde in Mexico and Subsidies for Energy Efficiency in Chile) focus on energy efficiency and reducing the use of fossil fuels. Finally, evaluations of sustainability of low-cost housing in Mexico and Chile either have thermal comfort as a fixed parameter, as buildings are assumed to be fully conditioned (Ochoa et al., 2014; Preciado-Pérez & Fotios, 2017) or studies are done for unconditioned buildings (Bustamante, 2016). Energy use or cost are given priority in these kinds of evaluations (and more so in practice), ignoring other relevant aspects of housing performance.

Ultimately, standards, regulations, initiatives and most studies do not consider the reality of low-cost housing in these countries. It is important to consider that materials and construction practices vary across regions, and perhaps more importantly, that in these buildings not all spaces have air conditioning and/or heating systems. In both cities, central systems are not common and in Copiapo, only a handful of rooms are heated.

Research Questions

Energy, comfort, environmental and economic metrics need to be considered together to provide a complete picture of their performance and interactions, something that is not common in a typical energy simulation analysis. These were the drivers that defined and shaped our methodology.

With a wide variety of available measures, a big challenge is to identify those that will be the most effective while considering comfort alongside environmental and financial factors. So how can one identify the most holistically competitive strategies in this context? And most importantly, how can comfort be prioritized in low-cost housing in different desert climates, and what are the opportunities and contradictions for sustainability in such context within the current financial, political, and construction frameworks in Mexico and Chile?

Methodology

Two low-income houses located in Hermosillo, Mexico and Copiapo, Chile were modeled using DesignBuilder. Emphasis was given on accurately representing the reality of low-income housing in each region. Two baseline models were produced for each region, one for a detached house and one for a paired house. The building layout for each case was based on a real low-income housing project available in the market representative of a typical unit in layout and building area. Figure 1 represents the methodology and workflow.

Different tectonic configurations related to the building envelope were selected based on available materials and current construction and political frameworks in each region, including wall and roof materials and insulation, glazing type, and shading. These were evaluated, through energy simulation, using a set of six indicators:

- Thermal Comfort (Cold and Hot Discomfort Degrees)
- Ventilation (Air Changes per hour, ACH)
- Construction cost (MXN, CLP)
- Annual operation cost (MXN, CLP)
- Operative carbon emissions (CO^2)
- Embodied carbon (CO^2)

Results

Results illustrated the importance of having an integrative view when assessing building performance and considering the local practices and culture surrounding buildings. Several opportunities and contradictions within the current frameworks were identified in each region.

Alternative construction systems can provide significant comfort, economic and environmental benefits for minimal or even no additional investment. Wood construction in Copiapo, for example, could not only provide higher levels of comfort for occupants but also support carbon mitigation policies, but its use is not incentivized in the region and labor is not adequately trained in this construction system. Similarly, in Hermosillo, adobe construction (a vernacular technique in the region) provides a reduction in both hot and cold discomfort, yet few homes are built with adobe. It is important to consider the large quantities of available material and the low-tech process of its production, which makes it applicable for self-construction. Figure 2 shows in Red and green worse and better performance than the baseline (marked in blue), respectively.

CONFIGURATION	CDisD	HDisD	VENTILATION	CONSTRUCTION COST	OPERATION COST	EMBODIED CARBON	OPERATIVE CARBON
COP-A-W0R0	0%	0%	0%	0%	0%	0%	0%
COP-A-W0R1	-2%	-1%	0%	2%	-2%	0%	-1%
COP-A-W0R2	-3%	-1%	0%	3%	-4%	0%	-1%
COP-A-W0RV	0%	-2%	1%	0%	0%	0%	0%
COP-A-W0RV2	0%	-1%	1%	0%	0%	0%	0%
COP-A-W1R0	-85%	-6%	19%	24%	-60%	1%	-21%
COP-A-W1R1	-86%	-7%	19%	26%	-61%	1%	-21%
COP-A-W1R2	-86%	-9%	19%	27%	-62%	2%	-22%
COP-A-W2R0	-94%	-1%	26%	43%	-68%	2%	-24%
COP-A-W2R1	-94%	-2%	26%	45%	-69%	3%	-24%
COP-A-W2R2	-94%	-4%	26%	47%	-69%	3%	-24%
COP-A-W4R0	-63%	-5%	11%	0%	-44%	-21%	-15%
COP-A-W5R0	3%	2%	0%	9%	1%	78%	0%
COP-A-W6R0	5%	413%	15%	-5%	-2%	4%	-1%
COP-A-W7R0	-90%	175%	22%	-5%	-49%	-41%	-12%
COP-A-W8R0	-90%	72%	17%	0%	-49%	-41%	-12%

CONFIGURATION	CDisD	HDisD	VENTILATION	CONSTRUCTION COST	OPERATION COST	EMBODIED CARBON	OPERATIVE CARBON
HMO-P-W0R0	0%	0%	0%	0%	0%	0%	0%
HMO-P-W0R1	-32%	2%	0%	7%	0%	0%	0%
HMO-P-W0R2	-44%	1%	1%	11%	-1%	1%	-1%
HMO-P-W0R3	-51%	0%	0%	16%	-1%	1%	-1%
HMO-P-W0R4	3268%	74%	-3%	3%	60%	18%	21%
HMO-P-W0R5	36%	-16%	-1%	1%	-9%	1%	-2%
HMO-P-W1R0	-100%	36%	13%	3%	-11%	1%	-4%
HMO-P-W1R1	-100%	41%	13%	10%	-11%	1%	-4%
HMO-P-W1R2	-100%	40%	14%	14%	-11%	1%	-4%
HMO-P-W1R3	-100%	41%	14%	18%	-12%	2%	-5%
HMO-P-W2R0	-100%	32%	13%	2%	-11%	0%	-4%
HMO-P-W2R1	-100%	37%	13%	9%	-11%	1%	-4%
HMO-P-W2R2	-100%	36%	13%	13%	-11%	1%	-4%
HMO-P-W2R3	-100%	36%	13%	18%	-12%	2%	-5%
HMO-P-W3R0	-100%	48%	15%	6%	-11%	1%	-4%
HMO-P-W3R1	-100%	54%	16%	13%	-11%	1%	-5%
HMO-P-W3R2	-100%	53%	16%	17%	-12%	2%	-5%
HMO-P-W3R3	-100%	54%	16%	21%	-12%	2%	-5%
HMO-P-W4R0	-100%	29%	13%	19%	0%	-4%	0%
HMO-P-W5R0	74%	-18%	-2%	10%	2%	133%	2%
HMO-P-W6R0	-31%	3%	1%	9%	-1%	50%	-1%
HMO-P-W7R0	-24%	1%	1%	3%	0%	2%	0%
HMO-P-W7R5	5%	-15%	-1%	4%	-9%	3%	-2%

HMO Hermosillo
COP Copiapo
A Detached
P Paired
Wo Baseline wall

W1 Wo + insulation
W2 Wo + insulation
W3 Wo + insulation
W4 Adobe brick
W8 Reinforced concrete

W6 Red brick
W7 Timber frame
Ro Baseline roof
R1 Insulated to code
R2 More insulated

R3 Most insulated
R4 Concrete slab
R5 Reflective coating
R6 Baseline roof
R1 Insulated to code

R2 More insulated
R3 Most insulated
R4 Concrete slab
R5 Reflective coating

Figure 2 Indicator results for a paired house in Copiapo and Hermosillo considering Roof insulation, wall insulation, adobe and wood as main materials (highlighted in gray) . Red and green represent worse and better performance than the baseline (marked in blue), respectively.

Conclusion

While the drive and the interest for low-cost sustainable housing exists in both countries, not all the components are in the right place. Certainly, there are difficulties in setting up wide-reaching and universal policies and programs that also consider climate, material and typology variations, but some alternatives and strategies could be supported by the construction industry and government through code reforms, additional subsidies and research, as well by educating the population in terms of the benefits of sustainability and qualified labor. Furthermore, more emphasis could be given to natural ventilation and window-to-wall ratio in future code, as these strategies can help prevent overheating in certain seasons by increasing the ventilation rate, and provide other benefits related to wellbeing (ventilation, daylighting, increased views).

It is imperative to conclude by emphasizing the importance of having a complete, integrated view when assessing building performance. This is often overlooked when methodologies and standards are exported from one place to another, a common occurrence in Mexico and Chile, and it is especially important to consider as it defines the necessary metrics and as it can have significant impacts in the results.

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An Assessment of Environmental Aspects of Sleep Health in a Private College

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Introduction

Poor sleep is currently one of the most common health issues for 25% of people living in the United States. Adults reported having insufficient sleep for at least 15 out of every 30 days (Healthy People 2020).

Abstract

College environment has a significant impact on students' sleep health. Lack of sleep and irregular sleeping patterns can lead to obesity, depression, and cardiovascular disease, which can be detrimental to one's physical and mental well-being. National Institute of Health, using the Pittsburgh Sleep Quality Index (PSQI) on college students, reported about 60% of students in the US suffer from poor quality of sleep. American College Health Association [ACHA] has started assessing sleep health status of several colleges and indicated that most colleges do not offer a positive environment to promote student sleep health. The purpose of this study was to assess the environmental factors related to sleep health of a Northeastern private college. An observational study design was conducted using a College Sleep Environmental Scan instrument that was developed by the University of St. Thomas, Minnesota. The scan consisted of eleven sections on college environment. Results indicated that out of a possible 269 points, this college scored 152 points. This equates to a score of 57% out of the total score, indicating that this college would receive an F letter grade based on the academic grading scale. Since this is a mid-sized private school in a rural, "healthy" town, the environment was expected to be positive. Apparently, there is a room for improvement in many areas. Based on the findings, a set of recommendations is provided for the college to consider environmental modification and promote students' sleep health.

Background

- Sleep is a complex and dynamic process that affects brain, heart, and lung function, in addition to other body functions such as metabolism, immune function, mood, and disease resistance
- Recommended Amount of Sleep: 7-9 hours per day for adults (NIH, 2019)
- An analysis of data from 3 separate studies suggests that sleeping or fewer hours per night may increase mortality risk by as much as 15% (Harvard Medical School, 2008)
- The 2013 American College Health Association's National College Health Assessment (NCHA-II) analyzed data from 153 colleges and universities (ACHA, 2013)
- The NCHA-II found that 70% of campus stores sell energy beverages, 60% sell energy nutritional supplements, and 40% sell caffeine pills (ACHA, 2013)
- The College Sleep Environmental Scan found that 94% of campus stores sell energy beverages, 80% sell energy nutritional supplements, and 55% sell caffeine in other forms, such as pills (Broek et al., 2014)

Research Question

What environmental factors on the private college's campus impact the quality of sleep of its students?

Methodology

- An observational study design using primary data on a Northeastern mid-sized private college in a rural, "healthy" town
- Environmental status on positive sleep health for the students was observed
- The instrument used was the College Sleep Environmental Scan developed by the University of St. Thomas, Minnesota, 2016
- Scan has 11 sections: campus facilities, on-campus sales, vending machines, academics, accommodations, residence housing, residence policies, programming, student health, sleep education, and an assessment
- Answers to questions from each section are totaled to determine overall score
- The data collected from the Northeastern mid-sized private college was then compared to data from other schools that have completed the environmental scan to determine if this college is around average, or better or worse in terms of sleep health than other schools

Participants

A medium-sized liberal arts college in the Northeastern United States. There are about 6,200 undergraduate students, about 470 graduate students, and about 1000 faculty members employed by the college

Results

Sections	Points Possible	Assessment Score	Percent Score
Campus Facilities	39	27	69%
On-Campus Sales	34	16	47%
Vending Machines	18	9	50%
Academics	18	12	67%
Accomodations	12	9	75%
Residence Housing	36	16	44%
Residence Policies	26	17	65%
Programming	15	10	67%
Student Health	15	0	0%
Sleep Education	47	30	64%
Assessment	9	6	67%
Total Score	269	152	57%

Conclusion

- Scores ranged from 0% on Student Health section to 75% on Accommodations section
- Student Health: the college does not have sleep behavior questions on health history intake or a referral relationship with a sleep clinic
- Residence Housing (44%): the college does not have air circulation for individual rooms or dimmable lights in dorm rooms
- Campus Facilities (69%): athletic facilities close before 10pm on weekdays and computer labs open before 8am on weekends
- Accommodations: high priority class registration and housing accommodations for students with sleep disorders
- The assessed college did not meet the criteria f0r positive sleep health. Therefore, we propose some changes to the college environment to increase the score on the College Sleep Environmental Scan

Recommendations

1. Close library at 11:30pm
2. Decrease campus bandwidth at night
3. Make lights in dorm rooms dimmable
4. Offer designated floor for students with sleep difficulties
5. Add questions about sleep to initial health history intake
6. Require section about sleep in all syllabi and alter submission time to **before 10pm**
7. Create napping spaces in Campus Center
8. Stop selling caffeinated beverages at 10pm

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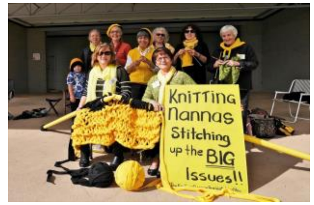

Who are the KNAGs?

What began in 2012 as a rural women's not in my backyard movement in the Northern Rivers region (New South Wales, Australia) has captured the engagement of other regional and city-based women. There are now almost 40 groups, called "Loops" around Australia with some in the UK and USA. Nannas range in age from 45 to 84; are generally retired or work part-time; and mostly never been activists but have been involved in contributing to their communities.

Crafting social movement learning with the Knitting Nannas Against Gas and Greed (KNAG)

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Abstract

Knot the Gate! Keep Calm - Hug a Nanna! Never underestimate the power of a Nanna! Viva La Nannalution! These emblems and iconography have been used to build agency through the craftivism of the Knitting Nannas Against Gas and Greed (KNAG). This movement of women are synonymous with successful nonviolent anti-fracking and climate crisis protest. They present a different Australian eco-activist approach engaging older women, a group not usually visible or vocal due to both age and gender stereotyping. Using the metaphor of knitting they form 'Loops' – over 30 since start-up in 2012.

As their name indicates, KNAG adopt the knitting (and other arts and crafts) to learn through 'crafty' processes and start conversations inspiring and connecting people thus contributing to social change towards transitioning away from fossil fuels. Over seven years this movement has used crafting and graphic arts as a tool for activism, informal environmental adult learning, and growing their social movement. Through data drawn from active KNAG members in Australia a range of crafted forms, memes, and iconography are discussed in order to analyse how this contributes to "Nannagogy" i.e. KNAG social movement learning processes. The relationship to feminist new materialism and the transformative power of micropolitics is considered. Part of a larger PhD research project involving gender and identity in eco-activism, the article concludes with an assessment of the Knitting Nannas use of crafting as a feminist methodology in creatively articulating feminist politics and the implications for gender and identity in social movement learning theory.

Relevance

This research investigates how KNAG use craftivism for learning the ins and outs of eco-activism as they address:

- The crisis of confidence in politicians by demanding the social contract and representative democracy be upheld i.e. working for the people and not big business;
- The climate crisis by challenging misinformation and denialism with evidence-based research;
- The crisis of sexism coupled with ageism that women face in becoming increasingly ignored and invisible as we age affecting, amongst other things, our prospects of well-ageing;
- The unresolved legacy of colonisation;
- Solastalgia and Solophilia – the loss and love of place (Albrecht, 2019).

Research Questions

What motivates and engages older women to be Knitting Nannas so that they become environmental champions in actively contributing to the transition to low-carbon economies?

- Who are the Knitting Nannas and what are their characteristics?
- What is it that women learn about through being a Knitting Nanna?
- What are the implications of the Knitting Nannas' experiences for later in life environmental adult education?

Methodology

A mixed method descriptive case study approach of a 'multisite bounded system' is used to understand the learning processes of the women in the network (Merriam, 2014, p. 49). The data are drawn from information collected with active Nannas in Australia including written (online) survey data, one-on-one interviews (face-to-face and online video capture), and document analysis of social media in the public domain (Facebook posts, digital videos, e-news bulletins). Researcher auto-ethnography is also included. The research has been approved by the Human Research Ethics Committee, James Cook University.

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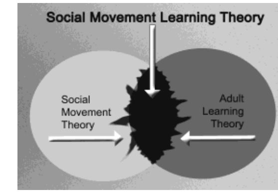
Theory – Social Movement Learning & "Nannagogy"

My research is about how and what adults learn through becoming environmental activists. To do this I combine social movement theory with adult learning theory and focus on the intersection of both, i.e. social movement learning theory. As you can see in this diagram.

I am particularly concerned with the context of older women becoming visible and vocal as advocates of intergenerational climate justice. My work relates to ecofeminism, gender studies and implications of well-ageing. Because my case study is a social movement called the Knitting Nannas Against Gas and Greed (aka KNAG) I call my work "Nannagogy" i.e the learning processes of older women championing environmental causes.



In order to conceptualise learning in the climate justice movement I have taken on the work of Kluttz & Walter (2018 p.98) who expanded on Scandrett et al (2010).
Kluttz and Walter write, Social Movement Learning Processes are:

- complex, dynamic, and messy; constantly shifting from the individual to the collective and back again; and
- dependent on specific social, cultural and historical contexts.

"… we understand social movements in part as identity movements through which both individuals and the collective engage in cognitive praxis to learn new identities, create new knowledge and take action for social change".

Craftivism gives Nannas their identity and is a process by which they learn their activism. Craftivism emboldens and empowers older women to challenge gender and age-related stereotypes to become vibrant and central actors in the broader social movement fighting unconventional coal seam gas extraction and fossil fuel mining, thus contributing to transitioning to low-carbon futures. In the process, they have also become part of the feminist project towards gender equality. **Their "Nannafesto" spells it out as they "sit, knit, plot, have a cuppa, and bear witness to the war against those who try to rape our land and divide our communities."** https://knitting-nannas.com/philosphy.php

Craftivism combines craft with activism using non-violent means to achieve social and political change (Greer, 2014; Fitzpatrick, 2018). The objective is sustainable change based on many small actions and ideas coalescing to create transformation. Tal Fitzpatrick and Katve-Kaisa Konturri (2015 p.1) assert that, "craftivism looks to engage with anyone and everyone in conversation and reflection around critical issues and wicked problems." It is "a movement that combines the principles of social, political, and environmental justice with individual creativity, the act of making by hand, the power of connecting with like-minded people, and a spirit of kindness, generosity and joy " (ibid). Relationship and community are central to the use of craft for activist purposes. **Craftivism promotes a participatory, democratic culture and use of "wide-ranging media"** (Close, 2018, p. 871).

Lizzy Emery positions crafting and being crafty as **"a methodology for touching the world with feminist hands"** (2018). This acknowledges that crafting and by extension, craftivism, is a primarily woman-centred activity and has potential to be a feminist enterprise.

"To craft is to make with feminist energy. To build. To build a world, an environment, a location. Feminist crafters craft in and of the existing world. But worlds that once did not exist are also crafted into materiality, into being, we craft feminist worlds. The practice of crafting, makes crafted spaces." (Emery, 2018, p. 2)

When women form groups there are connections to first wave feminism's Suffragettes; second wave feminism's women's liberation movement consciousness-raising groups; and eco-feminist women's peace camps (Greenham Common and Pine Gap, 1980's).

Feminist pedagogical thought has been incorporating relationality and touch as ways of achieving transformative learning. "Whether knitting, hugging, or engaging in other relational encounters, pedagogies of touch enhance moments of knowing and being that are unfamiliar."(Springgay, 2010). Shoshana Magnet et al (2014) draw on the "politics of kindness" to develop a pedagogy that encourages curiosity which leads to learning. An unromanticised form of pedagogical kindness enables a safe learning environment and greater possibility for dialogue. In the classroom as in society **"small acts" or "micropolitics" can mobilise political and social change by working through "small acts of political engagement … on the level of bodily affect or cultural sensibility".**

Second-hand Movement

Environmental Activism or Democratized Consumerism

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Sixteenth International Conference on Environmental, Cultural, Economic & Social Sustainability

Sustainability Lessons in the "Global South": Priorities, Opportunities, and Risks

29–31 January 2020

Pontifical Catholic University of Chile & University of Chile

Santiago, Chile

1. Introduction (Encountering the Question)

When I started living in Canada as an international student, the popularity and the overall span of the second-hand economy really surprised me. I had been familiar with the second-hand movement as a social tendency toward questioning traditional ownership values, but the scales were not comparable. The amount of second-hand clothing and accessories that were exchanged was out of my imagination. I saw people coming to Montreal, bringing half-loaded luggage and leaving the city empty-handed (other than intellectual and monetary achievements). They would buy used items from clothing to furniture and would return them to the second-hand cycle when deciding to move. I met several environmental groups promoting second-hand fashion while hearing many people encouraged their friends to participate in second-hand regarding its potential economic benefits. The popularity of second-hand activities was not the only surprise. I noted a paradoxical attitude of Canadian consumers: massive waste generation versus high participation in the circular economy. Canada is among one of the highest waste producers in the world, and each Canadian dumps 37 kg of only apparel and textile every year (Sun, 2018). These complex situations and contradictory behavioral observations motivated me to look at the topic on a larger national scale. In this paper, I aim to draw a better picture of Canadian second-hand economy. I would like to explore how second-hand activities and participants' motivations and priorities changed in 2014-2017.

2. Background

Different economic models and approaches are introduced as environmental issues grow, and raw material prices rise (Bechtel, Bojko, & Völkel, 2013, p. 5; George, Lin, & Chen, Y., 2015). Witnessing the unsustainability of development programs, many scholars and activists such as economists, environmentalists, and social scientists have proposed more sustainable models of social changes and economic improvements (Carson, 1962; Boulding, 1966; Commoner, 1971; Meadows, Meadows, Randers, Behrens, 1972; Stahel, & Reday-Mulvey, 1981; Pearce & Turner,1990). Raised awareness has fostered growing efforts to preserve natural resources; some industries and people have employed different techniques to extend the life cycle of commodities through recycling, reusing, and repurposing (Zink & Geyer, 2017; Frodermann, 2018). We are seeing a global campaign attempting to increase the life span of goods, which is called here as "second-hand movement."

➢ Theoretical Foundations

This section intends to provide a brief review of the theoretical origins of the movement and to investigate the motivations and behavior of the participants. Resource limitations of the earth, as well as socio-economic problems associated with *Pro-Growth Economics*, have urged many scholars and politicians to seek a new paradigm of development which prevent or optimize further exploitation of natural and human resources; more sustainable development models have been introduced to overcome the environmental and social issues (including land degradation, water, and air pollution, and habitat destruction and current models) resulted from the current and previous systems (Hobson, & Lynch, 2016; Raftowicz-Filipkiewicz, 2016; Korhonen, Honkasalo, & Seppälä, 2018). An overarching approach has been followed to avoid wasting resources, supporting the potential for longer lifespan of products and their return to consumption cycles (Bechtel, Bojko, & Völkel, 2013). The approach criticizes the current production and consumption system as a linear system that turns goods to waste after a short life span (Bonviu, 2014; Hobson, 2016), whose treating is a challenging issue for society; it proposes circular economic processes.

- A Circular Economy Model of Economic Growth

Circular economic models aim to foster more circular "flows of materials, labor, energy, and information"; they expect to rebuild "natural and social" capitals by simulating ecological cycles and revisiting the concept of waste (Bechtel, Bojko, & Völkel, 2013, p. 5). Taking inspiration from nature and ecological cycles to develop economic models could be traced back to the academic works of the 1960s. Kenneth E. Boulding (1966) and Rachel Carson (1962) claimed that the economy and society could not survive for long if ecological principles were violated. Boulding (1966) used spaceship allegory to illustrate the reality of our lives. He argued that the planet Earth should be seen "as a single spaceship with limited reservoirs of anything, either for extraction or for pollution" (George, Lin, & Chen, 2015, p. 2). It is essential for human survival and for the preservation of resources to reuse and recycle (Blomsma & Brennan, 2017; Frodermann, 2018). This analytical and scientific approach was followed by many scholars in the following decades. Commoner (1971), Meadows et al. (1972), and Stahel and Reday-Mulvey (1981) developed the idea of an economy conforming to the law of ecology. They argue that in an ideal economy, functioning in loops, waste would not exist as it would supply other production-consumption processes.

In the early 1990s, David Pearce and R. Kerry Turner coined the term, 'Circular Economy.' They defined a circular economy as a system in which 'consumption' was replaced by 'use of materials' and goods could be reused and repurposed through different life cycles. According to MacArthur (2013), a circular economy follows a few simple principles: design out waste, build resilience through diversity, rely on renewable energy sources, apply holistic thinking, think in cascades. -

Participants in Second-Hand Movement

With the expansion of the second-hand market, many scholarly works have been conducted on the attitudes and motivations of the participants (Ertz, Lecompte, & Durif, 2017; Kirsi Laitala, 2017; Hobson, & Lynch, 2016; Clarke, 2010). Ertz et al. (2017), applying the Holbrook's (1996) consumption-value framework, study the behavior of people participating in the second-hand economy. The framework investigates utilitarian, experiential, protester, spiritual motivations of the consumers. The study discusses that both acquisition and disposal activities are mainly driven by utilitarian motivations, followed by the spiritual, protester, and experiential aspects. The difference is that the utilitarian motives shown to be less important for people while disposing than while acquiring goods.

There is another research reviewing the literature on apparel disposal behavior conducted by Kirsi Laitala (2017). Laitala distinguishes between the psychological and functional motives behind the disposal of apparel and garments. Her research indicates that quality-related and functional issues such as tear and wear are among the most discussed motivations, followed by psychological reasons like fashion and taste. Laitala argues that disposal methods are "chosen based on characteristics related to the product, the individual, and the surrounding structures" (2017, p. 452). The accessibility of recycling centers and charities, in general, plays a major role in the choice of disposal methods. Different motivations drive people to donate or to sell: people are mainly motivated to donate to avoid wasting usable garments and help the needy and economic benefits lead people toward selling garments.

Some scholars have taken a more critical look at the expansion of the circular economy and second-hand movement. Kersty Hobson and Nicholas Lynch (2016) warn us, promoting the circular economy may end up commodifying parts of the day-to-day life that have previously played an important role in community-building, such as sharing practices. They are concerned that capitalism has entered other aspects of human life and social economy and is moving towards monetizing them. Hobson and Lynch, looking at online sharing platforms, such as Airbnb and TaskRabbit, argue that geographical and age inequality in access to the internet could lead to boosting economic growth in some parts of the society but would exclude others.

Alison Clarke (2010) is also interested in the online second-hand market. She looks at luxury handbags and accessories. She points out that websites like Bag Borrow and Steal allow consumers, who cannot afford designer brands or who do not want to fill their wardrobes with expensive outmoded items, to lease them temporarily. Clarke (2010) discusses that such platforms "offer a potential democratized relation to fashion consumption in which economic power is not directly aligned with brand access" (p. 238). These companies lead online shoppers toward extensive indulgence while feeling gratified by the savings they make. New marketing concepts such as pre-loved and vintage shopping, by mystifying the past of used items, seek to question the traditional values associated with the ownership and possession. However, other traditional concepts like authenticity and branding are still welcomed; it reinforces the tendency toward fetishizing commodities in capitalist society (Deng, 2019; Clarke, 2010).

3. Research Questions

This research aims to respond to the questions of the reality of and the transformations of Canadian second-hand economy. It will ask:

- What ate are the main activities practiced by Canadian second-hand economy participants?
- What motivates Canadians to participate in the second-hand economy and how the motivations have changed during the past four years?

4. Methodology

This paper presents a quantitative analysis of content and data provided by Kijiji website on Canadians' behavior and attitudes regarding the second-hand market. The data were collected through 4 years; 2014-2017 (Kijiji, 2015; Kijiji, 2016; Kijiji, 2017; Kijiji, 2018).

5. Results

Data analysis of the reports indicates that Canadians' participation in second-hand exchanges has been increasing since 2014. In 2017, 85 % of Canadians participated in the second-hand economy, and the total value of transactions made is about $ 28.5 billion, equivalent to 1.3 % of Canada's GDP. The number of exchanged second-hand items increased from 76 in 2014 to 80 in 2017 (table 1). As indicated in table (1), there has always been a gap between the number of acquired and disposed goods; they probably end up in land fields over time.

One of the issues mentioned in the literature is the economic interest in participating in the second-hand economy. Results show that each Canadian, by average, saved $ 480 through second-hand activities in 2015. The amount increased by 72 % and reached $ 824 in 2017(table 2). It should be noted that although theoeconomy areas such as sharing, more than 62 % of disposed goods are still donated or gifted. Howeverretical literature is concerned about the materialization of social, this is quite different from the proportion of items received through donation and gift-giving: only 32.7 %. That discrepancy can be due to the lack of need for donated goods or because they are sold by charities to generate income.

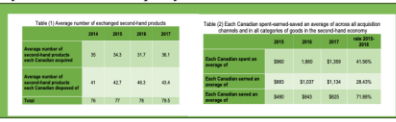

Table (1) Average number of exchanged second-hand products

	2014	2015	2016	2017
Average number of second-hand products each Canadian acquired	35	34.3	31.7	36.1
Average number of second-hand products each Canadian disposed of	41	42.7	46.3	43.4
Total	76	77	78	79.5

Table (2) Each Canadian spent-earned-saved an average of across all acquisition channels and in all categories of goods in the second-hand economy

	2015	2016	2017	rate 2015-2016
Each Canadian spent on average of	$960	1,890	$1,359	41.56%
Each Canadian earned on average of	$883	$1,037	$1,134	28.43%
Each Canadian saved an average of	$480	$843	$825	71.88%

Graph (1) Preferred second-hand products -2017

Table (3) Most exchanged goods

	1st	2nd	3rd	
2015	Clothing, Shoes, and Accessories 50.00%	Entertainment Items (DVDs, Books, etc.) 19.30%	Baby Clothing and Accessories 8.80%	Indoor/outdoor household and decoration items 4.40%
2016	Clothing, Shoes, and Accessories 38.20%	Entertainment Items (DVDs, Books, etc.) 18.60%	Baby Clothing and Accessories 7.40%	Games, Toys and Video Games 5%
2017	Clothing, Shoes, and Accessories 32.20%	Baby Clothing and Accessories 16.10%	Furniture 7.70%	Games, Toys and Video Games 5.30%

Among five the groups, displayed in graph (1), Cars and Trucks is the most and Clothing, Shoes, and Fashion Accessories is the least preferred categories to be purchased used. Looking at the number of transactions done through the second-hand economy in 2015-2017 shows that the least favorite group has the highest frequency (table 3). If we add baby's clothing and accessories to adults', about 50 % percent of the exchanges fall into this group. Furniture, which is the most durable group of items, was ranked 4th in terms of frequency. The first reason could be that the number of furniture purchased by people, is usually much smaller than the clothing; Furniture items are durable and require less replacement. The second reason could be the emergence of fast used-fashion. Affordable second-hand clothes allow people to buy more. Federal surveys show that the average share of clothing and accessories in Canadian household expenditure has been about 4% over the past years and been declining slowly (table 4). Given that second-hand economy has expanded in recent years, and the cost of clothing from the family basket has not changed much, it can be assumed that the number of acquired used garments has risen; it suggests that fast-fashion takeovers the second-hand market too.

Research findings regarding the motivations of participants toward acquisition and disposal activities are consistent with theoretical literature. The main reason for the second-hand acquisition is reported to be the lower price. However, the importance of economic motivations has diminished over the four years as the significance of environmental considerations grew. The significance of economic and ecological issues changed from respectively 75 % and 65% in 2014 to 72 % and 67 % in 2017 (table 5). In 2017, Pragmatic reasons, including the lack of space, had 74 % significant in handing out goods to the second-hand market. The pragmatic motivations have gained more importance during these years, but with the increasing popularity of the second-hand economy and growing environmental awareness, Ecological and Altruistic intentions have also been strengthened; it appears the gaps, seen in table (6), being narrowed.

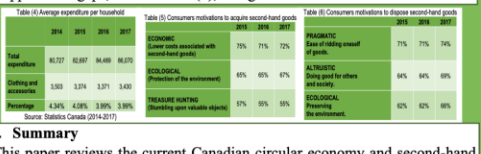

Table (4) Average expenditure per household

	2014	2015	2016	2017
Total expenditure	80,727	82,697	84,489	86,070
Clothing and accessories	3,503	3,374	3,371	3,430
Percentage	4.34%	4.08%	3.99%	3.99%

Source: Statistics Canada (2014-2017)

Table (5) Consumers motivations to acquire second-hand goods

	2015	2016	2017
ECONOMIC (Lower costs associated with second-hand goods)	75%	71%	72%
ECOLOGICAL (Protection of the environment)	65%	65%	67%
TREASURE HUNTING (Stumbling upon valuable objects)	57%	55%	55%

Table (6) Consumers motivations to dispose second-hand goods

	2015	2016	2017
PRAGMATIC Sale of ridding oneself of goods.	71%	71%	74%
ALTRUISTIC Doing good for others and society.	64%	64%	69%
ECOLOGICAL Preserving the environment.	62%	62%	66%

6. Summary

This paper reviews the current Canadian circular economy and second-hand practices. While the scholarly works emphasize the need for an economic model, which offers wiser exploitation of natural resources and more sustainable production-consumption relations, the conducted surveys show that primary motivations of second-hand economy participants are economic or pragmatic. Apparel and garments dominate in Canadian second-hand economy and constitute around 50 % of total exchanged goods. This paper argues that we are witnessing a democratized fashion movement; the circular economy provides a platform for more inclusive consumerism. Recirculated commodities could satisfy the consumerist demands and material aspirations of various segments of the society. It seems that the least emphasis is placed on the first principle of circular economy (design out waste). The primary solution to waste reduction and the most sustainable approach is to avoid purchasing/consuming in the first place. Recycling itself is energy-intensive and not enough to reduce natural resource extraction. Recycling reduces people's concerns over consumerism: The privileged ones think they are not contributing to waste generation because their used commodities are passed on to others through circular economy practices, and people who purchase second-hand goods do not feel damaging environment because they are acquiring items had already been bought. The possibility of recycling and reusing leads privileged people to consume more, and the low price of second-hand goods encourages squandering behavior. In this fast-paced modern world where interests and tastes change day by day, some people do not even have the patience for using clothes and garments until they are completely worn out. We have to be cautious otherwise non-durable and semi-durable consumer goods, such as clothing and accessories, could turn into transferable properties and liquid assets; it increases accessibility and create a more inclusive consumerist society but does not effectively contribute to natural resource preservation.

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Viva La Nannalution: Crafting social movement learning with the Knitting Nannas Against Gas and Greed (KNAG)

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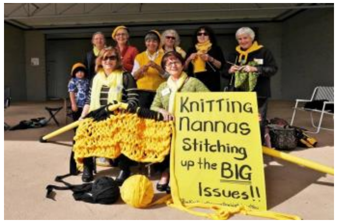


Abstract

Knot the Gate! Keep Calm - Hug a Nanna! Never underestimate the power of a Nanna! Viva La Nannalution! These emblems and iconography have been used to build agency through the craftivism of the Knitting Nannas Against Gas and Greed (KNAG). This movement of women are synonymous with successful nonviolent anti-fracking and climate crisis protest. They present a different Australian eco-activist approach engaging older women, a group not usually visible or vocal due to both age and gender stereotyping. Using the metaphor of knitting they form 'Loops' – over 30 since start-up in 2012.

As their name indicates, KNAG adopt the knitting (and other arts and crafts) to learn through 'crafty' processes and start conversations inspiring and connecting people thus contributing to social change towards transitioning away from fossil fuels. Over seven years this movement has used crafting and graphic arts as a tool for activism, informal environmental adult learning, and growing their social movement. Through data drawn from active KNAG members in Australia a range of crafted forms, memes, and iconography are discussed in order to analyse how this contributes to "Nannagogy" i.e. KNAG social movement learning processes. The relationship to feminist new materialism and the transformative power of micropolitics is considered. Part of a larger PhD research project involving gender and identity in eco-activism, the article concludes with an assessment of the Knitting Nannas use of crafting as a feminist methodology in creatively articulating feminist politics and the implications for gender and identity in social movement learning theory.

Relevance

This research investigates how KNAG use craftivism for learning the ins and outs of eco-activism as they address:

- The crisis of confidence in politicians by demanding the social contract and representative democracy be upheld i.e. working for the people and not big business;
- The climate crisis by challenging misinformation and denialism with evidence-based research;
- The crisis of sexism coupled with ageism that women face in becoming increasingly ignored and invisible as we age affecting, amongst other things, our prospects of well-ageing;
- The unresolved legacy of colonisation;
- Solastalgia and Solophilia – the loss and love of place (Albrecht, 2019).

Research Questions

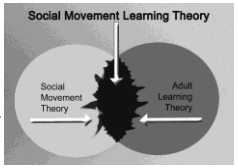
What motivates and engages older women to be Knitting Nannas so that they become environmental champions in actively contributing to the transition to low-carbon economies?

- Who are the Knitting Nannas and what are their characteristics?
- What is it that women learn about through being a Knitting Nanna?
- What are the implications of the Knitting Nannas' experiences for later in life environmental adult education?

Methodology

A mixed method descriptive case study approach of a 'multisite bounded system' is used to understand the learning processes of the women in the network (Merriam, 2014, p. 49). The data are drawn from information collected with active Nannas in Australia including written (online) survey data, one-on-one interviews (face-to-face and online video capture), and document analysis of social media in the public domain (Facebook posts, digital videos, e-news bulletins). Researcher auto-ethnography is also included. The research has been approved by the Human Research Ethics Committee, James Cook University.

Theory – Social Movement Learning & "Nannagogy"



My research is about how and what adults learn through becoming environmental activists. To do this I combine social movement theory with adult learning theory and focus on the intersection of both, i.e. social movement learning theory. As you can see in this diagram.

I am particularly concerned with the context of older women becoming visible and vocal as advocates of intergenerational climate justice. My work relates to ecofeminism, gender studies and implications of well-ageing. Because my case study is a social movement called the Knitting Nannas Against Gas and Greed (aka KNAG) I call my work "Nannagogy" i.e the learning processes of older women championing environmental causes.

Conceptualising learning in the climate justice movement builds on Kluttz & Walter (2018 p.98) who expanded on Scandrett et al (2010). They write, Social Movement Learning Processes are:

- complex, dynamic, and messy; constantly shifting from the individual to the collective and back again; and
- dependent on specific social, cultural and historical contexts, "*in part as identity movements through which both individuals and the collective engage in cognitive praxis to learn new identities, create new knowledge and take action for social change"*.

Who are the KNAGs?

What began in 2012 as a rural women's not in my backyard movement in the Northern Rivers region (New South Wales, Australia) has captured the engagement of other regional and city-based women. There are now almost 40 groups, called "Loops" around Australia with some in the UK and USA. Nannas range in age from 45 to 84; are generally retired or work part-time; and mostly never been activists but have been involved in contributing to their communities.

Craftivism gives Nannas their identity and is a process by which they learn their activism. Craftivism emboldens and empowers older women to challenge gender and age-related stereotypes to become vibrant and central actors in the broader social movement fighting unconventional coal seam gas extraction and fossil fuel mining, thus contributing to transitioning to low-carbon futures. In the process, they have also become part of the feminist project towards gender equality. **Their "Nannafesto" spells it out as they "sit, knit, plot, have a cuppa, and bear witness to the war against those who try to rape our land and divide our communities."** https://knitting-nannas.com/philosphy.php

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Lizzy Emery positions crafting and being crafty as **"a methodology for touching the world with feminist hands"** (2018). This acknowledges that crafting and by extension, craftivism, is a primarily woman-centred activity and has potential to be a feminist enterprise.

"To craft is to make with feminist energy. To build. To build a world, an environment, a location. Feminist crafters craft in and of the existing world. But worlds that once did not exist are also crafted into materiality, into being, we craft feminist worlds. The practice of crafting, makes crafted spaces." (Emery, 2018, p. 2)

When women form groups there are connections to first wave feminism's Suffragettes; second wave feminism's women's liberation movement consciousness-raising groups; and eco-feminist women's peace camps (Greenham Common and Pine Gap, 1980's).

Feminist pedagogical thought has been incorporating relationality and touch as ways of achieving transformative learning. "Whether knitting, hugging, or engaging in other relational encounters, pedagogies of touch enhance moments of knowing and being that are unfamiliar."(Springgay, 2010). Shoshana Magnet et al (2014) draw on the "politics of kindness" to develop a pedagogy that encourages curiosity which leads to learning. An unromanticised form of pedagogical kindness enables a safe learning environment and greater possibility for dialogue. In the classroom as in society **"small acts" or "micropolitics" can mobilise political and social change by working through "small acts of political engagement … on the level of bodily affect or cultural sensibility".**

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